Remarks

The Present Invention and the Pending Claims

The present invention relates to distributed computing.

Claims 1- 48 are pending and stand rejected.

The following pending claims have been cancelled: 2- 5, 7, 8, 10-25, 27, 30, 32, 35-37, 39- 48.

The following claims are pending: 1, 6, 9, 26, 28, 29, 31, 33, 34 and 38.

Reconsideration and allowance of the pending claims is respectfully requested.

Summary of the Office Action

Claims 1- 48 are rejected.

Claim 1 is rejected under 35 U.S.C. 102 (b) and 35 U.S.C. 103 (a).

Claim 6 is rejected under 35 U.S.C. 112, first paragraph as failing to comply with the enablement requirement and also under 35 U.S.C. 102 (b).

Claim 9 is rejected under 35 U.S.C. 102 (b).

Claim 26 is rejected under 35 U.S.C. 102 (b) and 35 U.S.C. 103 (a).

Claim 27-38 include limitations that are substantially similar to those of claims 1-25 and are rejected under the same prior art cited for the rejections of claims 1-25.

Amendment To The Claims

Claims 1, 6 and 26 have been amended. Claims 28, 29 and 34 are retained. No new matter has been added by way of these amendments. Claims 9, 31, 33 and 38 have been retained as originally filed.

Claim 1 has been amended to recite the limitation "wherein the component program does not contain routing information and information related to other component programs" and " a graphical user interface based application composer that composes said distributed application within said one or more data stores by allowing users to graphically specify the component programs that make up the application, the

communication routes between the component programs, and the nodes on which the component programs are to run". Support for the amendment is found at page 18, lines 1, 2 and in the description of element 502 in the specification.

Claim 6 has been amended to recite the limitation "through controller programs, wherein external applications are applications that cannot be installed within said network of computing devices". Support for the amendment is found at page 14, lines 20 - 33 in the specification.

Claim 26 has been amended along the lines of the amendment made to claim 1, to recite the limitation "using a graphical user interface based application composer that composes said distributed application within said one or more data stores by allowing users to graphically specify the component programs that make up the application", and "running multiple controller programs on multiple computing units in the network for transmitting data to input ports of the component program and receiving data from output ports of the component programs and for transmitting and receiving data with controller programs and disseminating said routing information to other controller programs", and "receiving said transmitted data at the input port of a component program, processing said data within said component program and writing the results to the output ports of the component program".

Claim 6 is rejected under U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

The office action states: "The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains or with which a is most nearly connected to make and/or use the invention. The specification recites: "The component programs present on each not are only concerned with taking the data presented by the controller programs on their input ports, processing the data and writing the results to their output ports. The controller programs provide an infrastructure for the component programs to interact with each. Claim 6 recites the system as recited in claim 1 wherein the component programs are adaptors for communicating with external applications that are not installed within the systems. In short claim 6 states the component programs performing the communication with each other. However the Specification states that the component programs are only in communication with the controller programs which handle communication between different systems. Examiner's understanding of the intended invention is that the complexity of the component programs is reduced due to the fact that they do not handle the communication prices between component programs. This raises questions of enablement to Examiner and further explanation is required."

In response to the above rejection, the applicant has amended claim 6 to expressly recite ".. through controller programs, wherein external applications are applications that cannot be installed within said network of computing devices".

The examiner's understanding of the invention is that the complexity of the component programs is reduced due to the fact that they do not handle the communication process between component programs. In response to the Examiner's request for further explanation of the present invention, the examiner is respectfully requested to refer to page 15, line 33 to page 16, line 5. The controller programs pass data from one component program to another and make the conglomeration of component programs work as one application. The routing of information is thus carried external to

the component programs. This enables decoupling of the computation by the component programs from the communication between them. The component programs merely perform the computational logic and are completely oblivious to their participation in the distributed application. Thus the invention also supports the use of pre-built component programs as well as externally developed component programs.

The office action states "Claims 1, 26 recite the limitation (or one similar to it) in which the distributed application is composed externally". It is vague and unclear to Examiner as to what the distributed application is external to, with read to what element. The claim currently reads as externally to anything and therefore has little patentable weight. Claim 1 recites the limitation "said component programs in line 2 limitation a. Claim 1 also recites be component programs in lines 3-4 of limitation c. There is inefficient antecedent basis for these limitation in the claim".

In response to the above rejection, applicant has amended claim 1 to recite the creation of distributed application using a graphical user interface. Claim 1 now expressly recites:

> "and wherein the component program does not contain routing information and information related to other component programs;
>
> a plurality of data stores on one or more of the computing units that contain a specification of component programs that make up the application, the communication routes between the component programs, and the nodes on which the component programs are to run; and
>
> a graphical user interface based application composer that composes said distributed application within said one or more data stores by allowing users to graphically specify the component programs that make up the application, the communication routes between the component programs, and the nodes on which the component programs are to run";

The applicant has also amended claim 26, to expressly recite the following:

> "..... using a graphical user interface based application composer that composes said distributed application within said one or more data stores by allowing users to graphically specify the component programs that make up the application, the communication routes between the component programs, and the nodes on which the component programs are to run;
>
> running multiple controller programs on multiple computing units in the network for transmitting data to input ports of the component program and receiving data from output ports of the component programs and for transmitting and receiving data with controller programs and disseminating said routing information to other controller programs;
>
> receiving said transmitted data at the input port of a component program, processing said data within said component program and writing the results to the output ports of the component program";

Accordingly, withdrawal of the rejection of claims 1, 6 and 26 under 35 U.S.C. 112 is respectfully requested.

Claims 1 and 26 is rejected under 35 U.S.C. 102 (b) as being anticipated by Ciscon et al. (U.S. 5,634,010).

MPEP section 2131 provides, in pertinent part: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. .... The identical invention must be shown in as complete detail as is contained in the ...claim".

The office action states "Claim 1 is rejected under 35 U.S.C. 102(b)as being anticipated

by Ciscon et al. which disclose a system for developing distributed applications over a network of computing units, the system comprising:

a. a plurality of component programs installed over the network of computing units to create the distributed application (Ciscon, col. 2, lines 31-35);

b. a plurality of data stores on one or more of the computing units comprising a plurality of routes for data transfer between the component program and a plurality of parameters for configuring the component programs (Ciscon, col. 2, lines 45-65, col.11, lines 5-25); and

a plurality of controller programs running on one or more of the computing units in the network for interfacing with the component programs and for interacting with other controller programs to send and receive data by referring to routing information from the data store (Ciscon, col. 2, lines 45-60);

Claims 26 and 39 include limitations that are substantially similar to those of claim 1, and are therefore rejected under the same prior art as claim 1."

In response to the above rejection, claim 1a has been amended to recite the elements of the component program which clearly distinguishes the component program of the applicant's invention over the "application process" of Ciscon et al. The component program of the applicant's invention only receives, processes and transmits data; it is not burdened with routing intelligence, a significant method step difference over Ciscon.

In contrast, the "application process" of Ciscon et al. contains routing or addressing information. The following sections within Ciscon et al. discloses that the "application process" of Ciscon et al. contains routing or addressing information. Ciscon et al. discloses in column 2, lines 53, 54 and lines 42, 43, 44 that "Each application process registers its interest in receiving certain types of objects with its local router.", and "Each object includes a time stamp, properties, and addressing information in addition to the underlying data itself." Also, column 8, line 20 to 24 of Ciscon et al. recites the application process contains addressing and routing information: "Addressing

information can be specified both when an object is distributed and when a process registers interest in an object. A destination address of an object is the address of the process that should receive it."

The disadvantage of such an application of prior art is discussed on page 2, line 14 of the background section of the applicant's patent application: "This results in an inflexible integrated application where any modification in the workflow or data routes entails changing the application code itself. Indeed, this is a very tedious process. Further, since data routing is embedded within the application code, any network failure may result in the halting of the integrated application, which in turn, may require re-routing the data as well as recompilation and re-launching of the integrated application. Therefore, EAI and B2B platforms provided by such companies tend to be very rigid and involve a lot of custom programming."

The Examiner is respectfully requested to refer to page 15, lines 22, 23, 24, 34 and page 16, lines 1 to 4 of the applicant's patent application that recite the structure and functionality of the component program. Page 15, lines 22 to 24 of applicant's disclosure recites: "The component programs present on each node are only concerned with taking the data presented by the controller programs on their input ports, processing the data and writing the results to their output ports. The controller programs simply provide an infrastructure for the component programs to interact with each other." Page 16, lines 1 to 4 of the applicant's patent recites: "This enables decoupling of the computation by the component programs from the communication between them. The component programs merely perform the computational logic and are completely oblivious to their participation in the distributed application."

The office action further states: "The claim language does not distinguish over the prior art because the claim language does not only require the limitations of the claim. The claim language does not exclude the component program from having addressing and routing information". Claim 1a has now been amended to recite: "wherein the only functionality of the component program is to receive data presented at its input ports,

process said data and write the results to its output ports, and wherein the component program does not contain routing information and information related to other component programs."

The limitation "wherein the component program does not contain routing information and information related to other component programs" is not found either explicitly or inherently in Ciscon et al. Hence, it is not anticipated by Ciscon.

Claim 1b has been amended to recite the creation of the distributed application using an application composer. The office action states that "it is unclear as to what is meant by "externally"". Claim 1b has been amended to remove the term "externally" and now specifically includes the term "specification of " the component program. The Examiner is respectfully requested to refer to the applicant's specification, page 14, line 20 to 24 that reads: "To compose a distributed application, the developer has to specify in a data store, the component programs that make up the application, the communication routes between these component programs, and the computing nodes on which the component programs would be run. This data store, would then, essentially represent the distributed application." Accordingly, applicant's data store is clearly distinguishable over Ciscon et al. which does not disclose the creation of such a data store and its subsequent use to generate the distributed application.

The limitation recited in claim 1 b of "a plurality of data stores on one or more of the computing units that contain a specification of component programs that make up the application" is not found either explicitly or inherently in Ciscon et al. Hence, claim 1 is not anticipated by Ciscon.

Furthermore, claim 1c has been amended to recite that a plurality of controller programs and component programs receive information from a controller program on the routing of data between component programs, locations of other component programs and inter-relationship and organization of other component programs in a distributed

application. Ciscon et al. does not disclose an element of similar structure or functionality in its system.

Claim 1 c, as amended, now recites the limitation of "a graphical user interface based application composer that composes said distributed application within said one or more data stores by allowing users to graphically specify the component programs that make up the application, the communication routes between the component programs, and the nodes on which the component programs are to run". This limitation is not found either explicitly or inherently in Ciscon et al. Hence, claim 1 is not anticipated by Ciscon.

Claim 1 has been amended at 1a, 1b and 1c to recite elements that are not expressly or inherently described by Ciscon et al, or identically shown in as complete detail in the system of Ciscon et al. For the reason stated above, applicant respectfully submits that under MPEP section 2131, claim 1 is not anticipated by Ciscon et al., and applicant solicits reconsideration of the rejection and allowance of claim 1.

Claim 26 has been amended to recite "multiple controller programs running on multiple computing units; composing said distributed application using a graphical user interface based application composer that composes said distributed application within said one or more data stores by allowing users to graphically specify the component programs that make up the application, the communication routes between the component programs, and the nodes on which the component programs are to run; running multiple controller programs on multiple computing units in the network for transmitting data to input ports of the component program and receiving data from output ports of the component programs and for transmitting and receiving data with controller programs and disseminating said routing information to other controller programs; receiving said transmitted data at the input port of a component program, processing said data within said component program and writing the results to the output ports of the component program". Claim 26 has been amended with limitations that are substantially similar to the amendments made in claim 1. For the reason stated above, applicant respectfully

submits that under MPEP section 2131, claim 26 is not anticipated by Ciscon et al., and applicant solicits reconsideration of the rejection and allowance of claim 26.

Claim 39 has been canceled.

Claim 6 is rejected under 35 U.S.C. 102 (b) as being anticipated by Ciscon et al. (U.S. 5,634,010).

The office action states that column 3, lines 5-10 of Ciscon discloses the limitation, substantially as claimed, as described in claim 1, including wherein the component programs are adaptors for communicating with external applications that are not installed within the system."

Claim 6 has now been amended to explicitly recite "the component programs are adaptors for indirectly communicating with external applications through controller programs, wherein external applications are applications that are not installed within said network of computing devices." In contrast, Ciscon discloses at column 3, lines 5-10: "By placing the burden of managing the network communications on the local routers, the complexity of the application code is reduced since it has only a single connection to its router. Such details as the operating system type and the network protocol are handled by the routers", but does not disclose direct communication between the component programs and the external applications.

The limitation "the component programs are adaptors for indirectly communicating with external applications through controller programs, wherein external applications are applications that are not installed within said network of computing devices" is not found either explicitly or inherently in Ciscon et al. Hence claim 6 is not anticipated by Ciscon et al.

Claim 9 is rejected under 35 U.S.C. 102 (b) as being anticipated by Ciscon et al. (U.S. 5,634,010).

The office action states that column 2, lines 57-62 of Ciscon discloses limitations, substantially as claimed, as described in claim 1, including wherein the data store can be replicated for high availability on a multiplicity of computing units".

Applicant's claim 9 recites "the data store can be replicated for high availability of computing units" In contrast, Ciscon at column 2, line 57-62 discloses: "Each local router has a connection table for keeping track of the routers that the local router is connected to. The connection table also maintains a list of the child processes connected to the local router". The above disclosure of Ciscon does not disclose the replicability of the data store on a multiplicity of computing units.

The limitation "the data store can be replicated for high availability of computing units" in claim 9 is not found either explicitly or inherently, in Ciscon et al. Accordingly, claim 9 is novel over Ciscon et al.

Claims 6 and 9 are now dependent on amended claim 1. Since claim 1 is not anticipated by Ciscon, claims 6 and 9 that depend on claim1 are also not anticipated by Ciscon.

Claim 28 is rejected under 35 U.S.C. 102 (b) as being anticipated by Ciscon et al. (U.S. 5,634,010).

The office action states that column 2, line 45 to column 3 line 20 of Ciscon discloses "installing component programs on computing units; specifying the external resources required by the component programs; specifying the input and output channels of the component programs; and making the component programs accessible to said computing units."

Ciscon at column 2, line 45 to column 3 line 20 discloses: "The data management and distribution includes local router processes that preferably run on each of the computers for managing the transfer of these objects. Each application process registers

its interests in receiving certain types of objects with its local router. The local router then propagates this interest to other routers in the network so that the routers are aware of each other's interests."

In the present application, the component program is registered and input and output channels are specified by the application composer. Furthermore, the sender component programs have no idea that their data is being routed to another component program (page 18, lines 1, 2). Whereas in Ciscon et al, the application process registers its interests in receiving certain types of objects with its local router. Hence, in the case of Ciscon et al., the application process actually determines the input and output channels, whereas in the case of the applicant, the input and output channels are dictated by the application composer.

The limitations "registering comprises the steps of: installing component programs on the computing units; specifying the external resources required by the component programs; specifying the input and output channels of the component programs; and making the component programs accessible to said computing units" in claim 28 are not found either explicitly or inherently, in Ciscon et al. Accordingly, claim 28 is novel over Ciscon et al.

Also, Claim 28 is now dependent on amended claim 26. Since claim 26 is not anticipated by Ciscon, claim 28 that depends on claim 26 is also not anticipated by Ciscon.

Claims 29 and 31 are rejected under 35 U.S.C. 102 (b) as being anticipated by Ciscon et al. (U.S. 5,634,010).

Claims 29 and 31 are now dependent on amended claim 26. Since claim 26 is not anticipated by Ciscon, claims 29 and 31 that depend on claim 26 are also not anticipated by Ciscon.

Claims 1 and 26 are rejected under 35 U.S.C. 103 (a) as being unpatentable.

The office action states "Claims 1 and 26 are rejected under 35 U.S.C 103(a) as being unpatentable over Applicant's Admitted Prior Art in the Background of Applicant's Specification herein referred to as APA."

The office action further states that regarding claim 1, APA disclosed a system for developing distributed applications over a network of computing units, the system comprising:

a. a plurality of component programs installed over the network of computing units to create the distributed application (APA, page 1, lines 18-25);

b. a plurality of data stores on one or more of the computing units comprising a plurality of routes for data transfer between the component program and a plurality of parameters for configuring the component programs (APA, page 2, lines 18-35, page 3 , lines 10-14, 20-25; APA also states that routes and work flow are stored within the memory of the system); and

c. a plurality of controller programs running on one or more of the computing units in the network for interfacing with the component programs and for interacting with other controller programs to send and receive data by referring to routing information from the data store (APA, page 3, lines 20-33, The central server is a computing unit within the network);"

In response to the rejection of claim element 1a over APA, recited on page 1, lines 18-25 of the applicant's patent application, applicant respectfully points out that the component program of the applicant is not equivalent to the "applications" recited in page 1, lines 18-25 of the application. The component program does not have the intelligence to specify the data routes and workflow. The "applications" disclosed on page 1, line 18-25 of the applicant's Background section of the patent application specify the data routes and workflow within the application code, is further described on page 2, line 18-35 in the Background section of the applicant's patent application.

In response to the rejection of claim element 1b over APA, recited on page 2, lines 18-35, and page 3 line 10-14, 20-25, applicant respectfully points out that the component program of the applicant is not equivalent to the "applications" discussed in page 3 line 10-14 of the applicants patent. The component program does not have the intelligence to specify the data routes and workflow. The "applications" discussed on page 3, line 10-14 of the applicant's Background section of the patent application specify the data routes and workflow within the application code. Also, the "controller programs" of the applicant's invention is not equivalent to the central server discussed in the background section of the applicant's patent application on page 3, line 20-25. The controller programs interact with one another and a plurality of controller programs control work flow and the routing tables, in contrast to a single central server that accomplishes this function as described in the Background section of the applicant's patent application on page 3, line 20-25.

In response to the rejection of claim element 1c over APA, recited on page 3, lines 20-33, applicant respectfully points out that the "controller programs" of the applicant's invention is not equivalent to the central server discussed in the Background section of the applicant's patent application on page 3, line 20-33. The controller programs interact with one another and a plurality of controller programs control work flow and the routing tables, in contrast to a single central server that accomplishes this function as described in the Background section of the applicant's patent application on page 3, line 20-33.

The arguments presented above with respect to claim 1 is equally applicable to claim 26.

The office action states "claims 32-34 and 38 include limitations that are substantially similar to those of claims 1, 6, 9, 26, 28-31 and are therefore rejected under the same prior art used in the rejections of claims 1, 6, 9, 26, 28-31 as being substantially similar".

In response, independent claims 1 and 26 have been appropriately amended. Therefore, claims 33, 34 and 38 are now dependent on amended claim 26, And applicant respectfully submits the rejection of claims 33, 34 and 38 be withdrawn.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of this application, the Examiner is requested to call the undersigned.

Respectfully submitted,

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